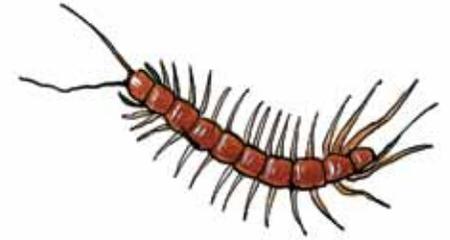
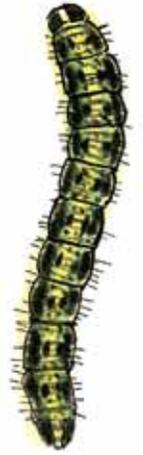


Nature Series

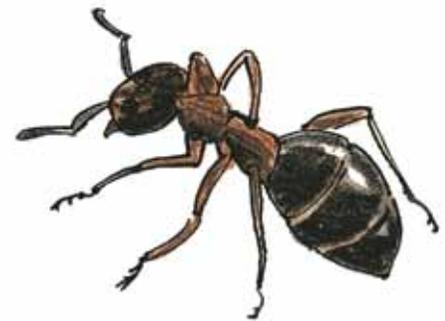


Insect Exploring Kit

WARNING:
NOT SUITABLE FOR
CHILDREN UNDER 3 YEARS
DUE TO SMALL PARTS



Insect Exploring Kit

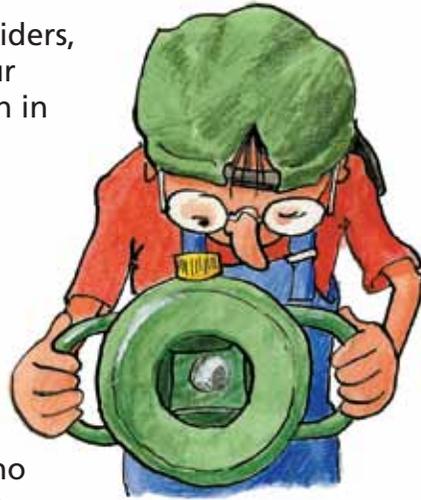


Bugs, Bugs and More Bugs

You will find an abundant mixture of spiders, beetles, and other insects, spiders in your garden, in the fields, in the soil and even in your living space.

There are more bugs in the world than there is any other living animal. They survive in the various environments we create by using techniques they have developed. This is why observing bugs has been so fascinating and stimulating.

There are lots of people in the world who have a fear or are totally grossed out by bugs.



*This kit contains almost all you will need for your experiments and observations. Mostly you will use the large **two-way magnifying glass**. By removing the upper part and placing your catch in the transparent tray, and replacing the upper part again, you can study the bug from above and below.*

Removing the upper part and looking through it, you can observe some creatures that you do not want to catch.



*Some creatures you should avoid and are better handled with tweezers or by using a sheet of paper to get under them. The ant lodge has a few parts. The **Mult-Level Ant House**, the long plastic **Ant Tunnel** and the **Ant Platform**. Following page 16 shows you exactly how to construct your ant farm.*

You will need to cut the shallow rectangular tray from the packaging and dull the corners and edges to prevent the possibility of injury!

Keep in mind:

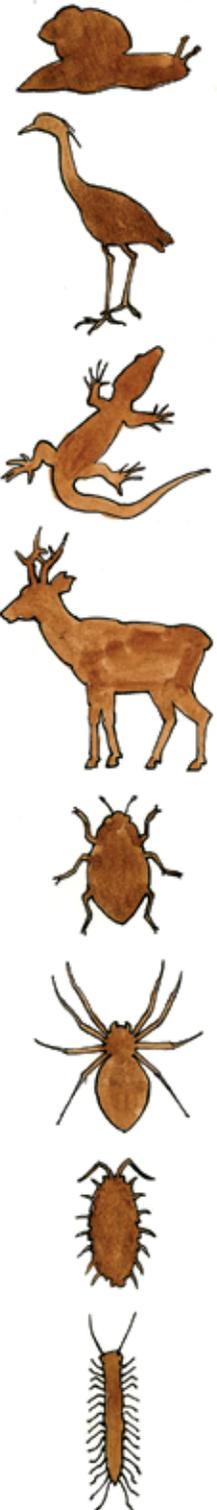
No matter what size the animal, they all want to live. You should not harm any creature just so you can look at it. Carefully catch you creatures and after you have finished observing them, let them go free as close to the spot you caught them as possible. Do not forget to keep these animals away from extensive heat and sun as much as possible. Also be careful of any bug you are not sure of, as they may sting and bite in an attempt to escape.

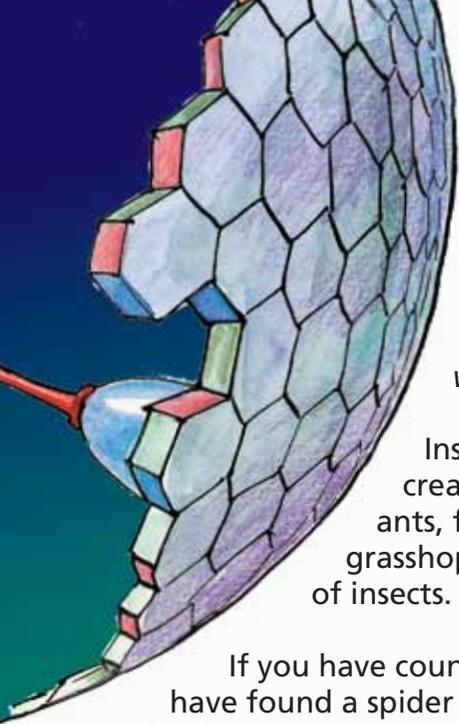
How to spot bug!



Use your magnifying glass for very small bugs; count the number of legs they have.

Bugs have 6 or more legs.



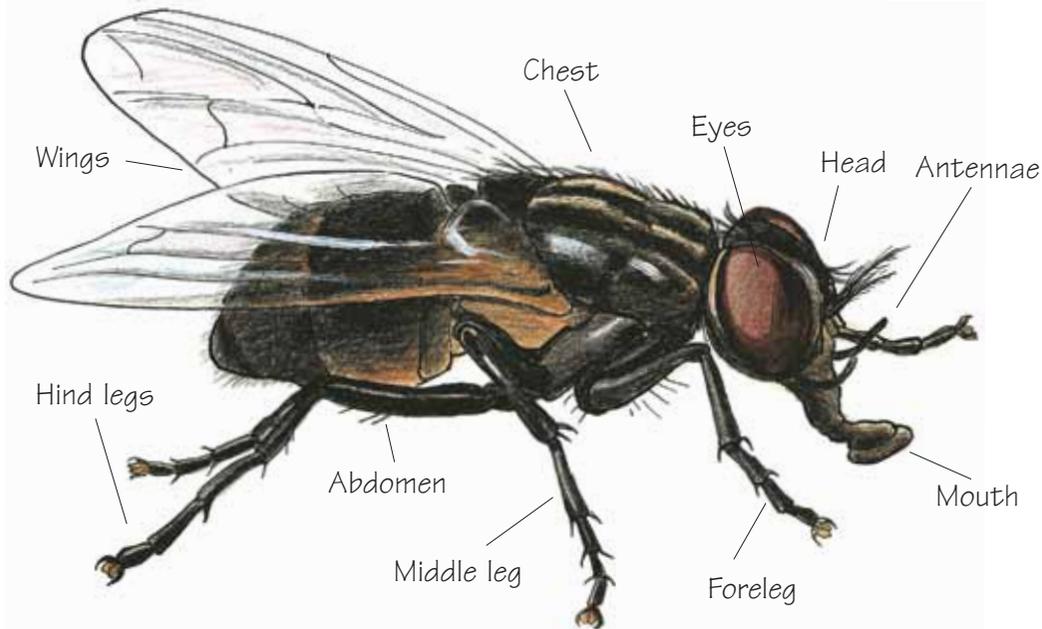


Multiple eyes:

Bug eyes contain a tremendous amount of permanent single eyes called Facets. The bugs' brain will take each image from one of these facets to create the total image of what it is looking at. These eyes can see incredibly high-speed movements that we cannot even see at all.

Insects have **6 legs**. This is the group of creatures that is most populated. Beetles, ants, flies, bees, and bumblebees, grasshoppers and earwigs all belong to the class of insects.

If you have counted as many as **8 legs**, you most likely have found a spider or some kind of mite. A wood louse has **14 tiny legs**. Centipedes have 100 legs and millipedes have 1000 legs.

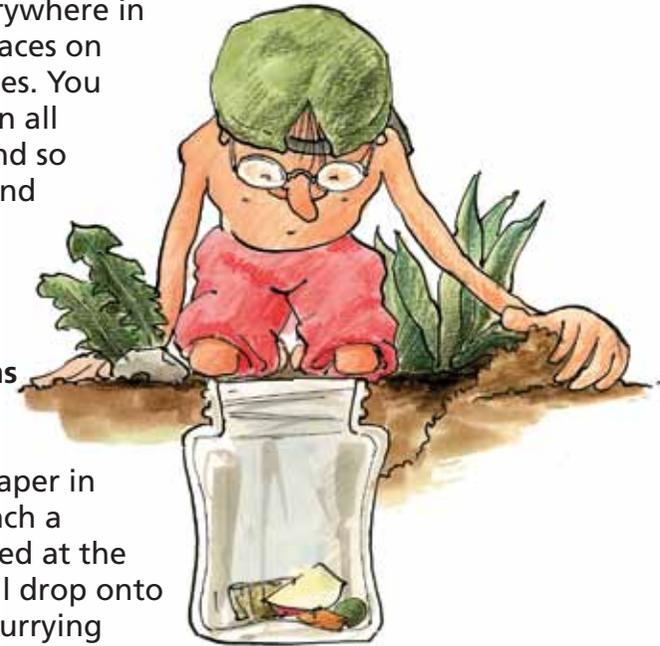


Where's the Bug?

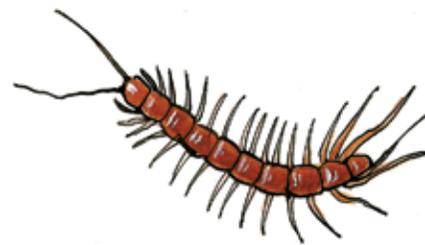
Bugs live practically everywhere in the world, but not all places on earth have the same types. You will find that they live on all sorts of environments and so catching them will depend on where they are residing.

You can catch a lot of bugs **on leaves, blossoms or the ground**.

Place a sheet of white paper in you tray and give a branch a shake. You will be amazed at the amount of bugs that will drop onto your paper and begin scurrying around looking for a way to escape.



Dig a hole in the soil and place an empty jar with its top level to the ground as shown in the illustration. After some time, you will see that some bugs have fallen in. You should view this trap very often and let the bugs go free after.

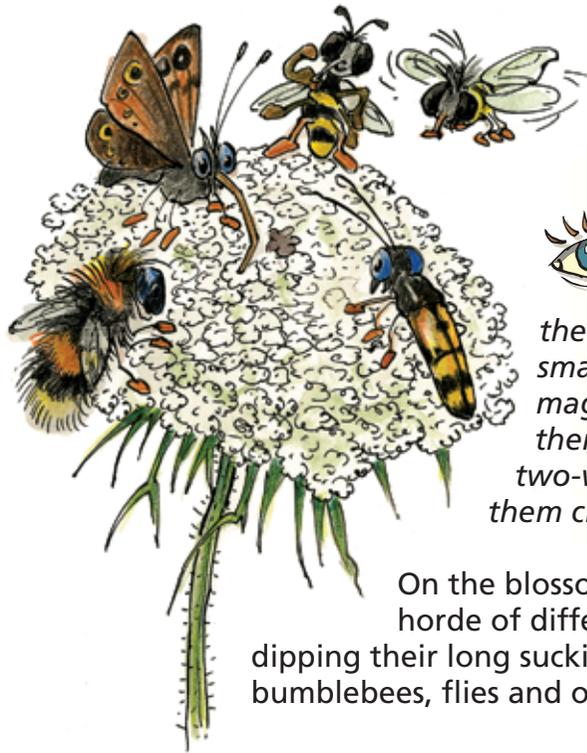


You can find centipedes, wood lice and possibly even an ants nest by turning over rocks and other **flat stones** replacing what you turn over afterwards.



A Sweet Tooth

A lot of flying bugs just loves anything containing sugar, just like we do. The bugs need energy in order to fly and sugar gives them this needed energy. Nectar from blossoms is a sugary liquid that flying bugs go after.



For about three-quarters of a year, you can find bugs. If you do not want to bother the bugs on the flowers, use the small lens from your two-way magnifying glass to look at them, otherwise you can use this two-way magnifying glass to study them closely.

On the blossom, you will find a whole horde of different bugs. From butterflies dipping their long sucking tubes into the nectar to bumblebees, flies and other colourful bugs.

Pollen Transportation Business

The reason blossoms produce nectar is to attract various flying bugs so they can transport its pollen to other blossoms thereby enabling other fruit and blossoms to grow. By landing on the blossom, flying insects are covered in this pollen and carry it to other plants.

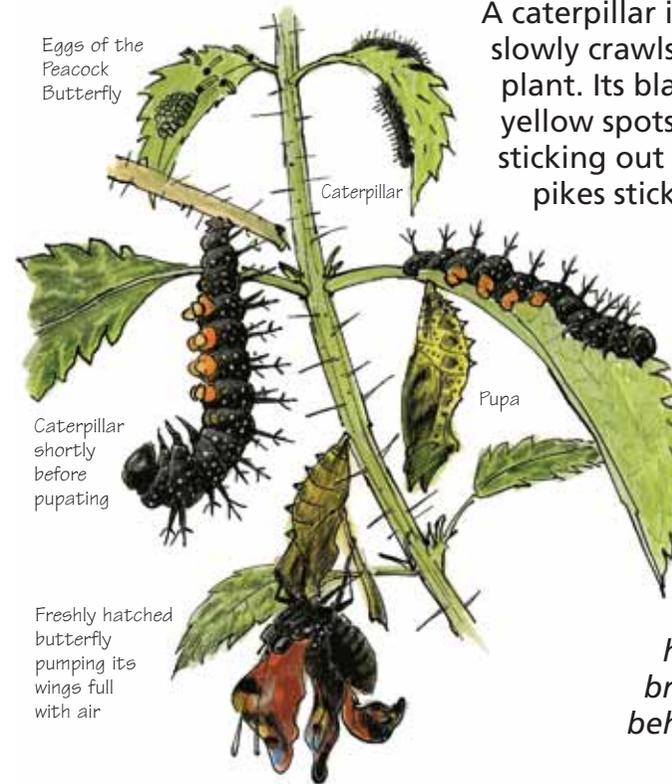


Caterpillar of the Large Cabbage Butterfly



What an Appetite

A caterpillar is a worm-like creature that slowly crawls on the leaves of the plant. Its black body is long with yellow spots. You can see tiny feet sticking out the bottom and small pikes sticking out everywhere.



Eggs of the Peacock Butterfly

Caterpillar

Caterpillar shortly before pupating

Freshly hatched butterfly pumping its wings full with air

Caterpillars are nothing to be scared of and are defiantly worth an observation in your Bug viewer. Feed it a fresh leaf while in your box and you will see how it eats the leaf with its round head. You will also see brown droppings left behind.

Laying her eggs on the plant is the female butterfly. Hatching from these eggs will be so tiny caterpillars that will eat and grow. They become pupae in a few weeks. What happens next is one of the marvels of nature. The caterpillar will transform itself into a butterfly, popping out of the pupa and flying away.

Some caterpillars can camouflage themselves very well, so you will have to look close.



Swallow-Tail Caterpillar





If you happen to find a caterpillar on a plant, you may get lucky and be able to see it transform into a butterfly. This will take a few days, so you have to keep checking on it.

Metamorphous
Peacock butterflies emerge from black caterpillars'.
Cabbage butterflies come from the green and yellow ones that eat the cabbage leaves.



Beetles In Abundance
Running beetles will hurry across the ground without delay. Upon close observation, you can see their strong jaw they use to catch insects and sometimes-even worms.
Snout beetles have a long nose that is a protrusion of their head to which its antennae are attached.
Fruit and plants are the favourite for the Snout beetles.

Bugs with built in Armour

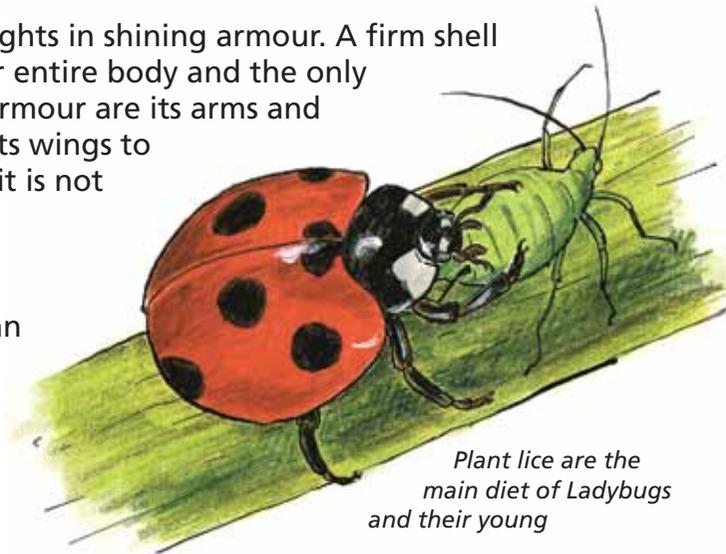
Rose Beetle



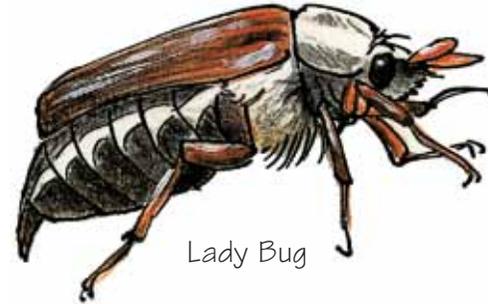
Ladybugs are quite easy to catch and look at in your magnifying glass. By counting the spots on their body you can determine which species of ladybug you have. The spots have absolutely nothing to do with how old the beetle is.

Beetles look like knights in shining armour. A firm shell totally protects their entire body and the only protrusions to this armour are its arms and legs. It even covers its wings to protect them when it is not flying.

More species in the beetle class exist than in anything else.



Plant lice are the main diet of Ladybugs and their young



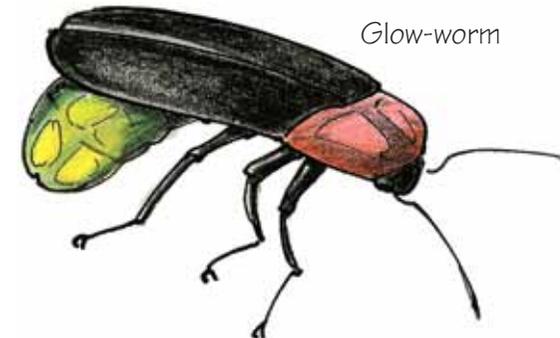
Lady Bug



Snout Beetle

Eye-Candy

The rose beetles, with its bright green body, often creep about the blossoms. One noteworthy is the Longicorn beetle. It has amazingly long, magnificent antennae. You may even get luck and see fireflies, also know as glow-worms. The male and female use this method to attract one another.



Glow-worm



Lice

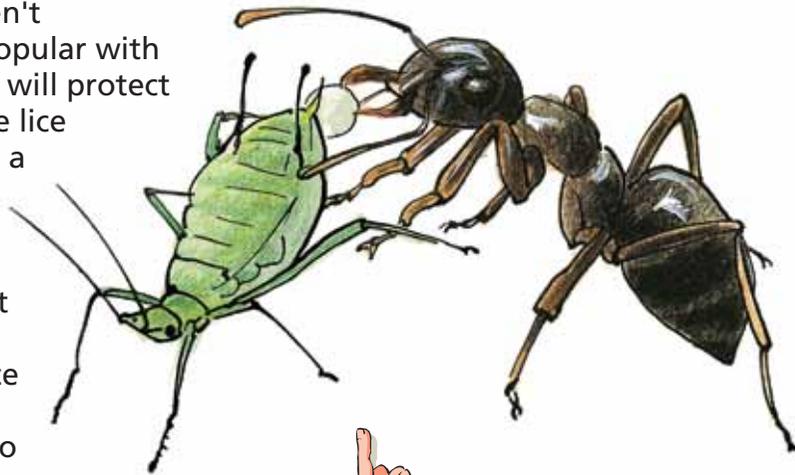
Green lice love to take a seat on a branch next to one another and insert their sucking tube in the fluid pipe in the stem of the plant.



Using your magnifying glass, you can observe exactly the way colony of lice attacks this fluid. Different size lice mean different ages. Older green lice grow but will scarcely modify their appearance and shape.

Ants

Green lice aren't particularly popular with humans. Ants will protect them, as these lice will discharge a sweet sticky fluid from their abdomen that attracts the ants. These lice are like a milking cow to the calves.



If your lucky enough to get some ants on the branch you have in your magnifying glass, you might just see this milking process happening. By taping the abdomen of the lice with its antennae, the lice will release a drop of this sugary fluid for the ant to consume.



Arachnids

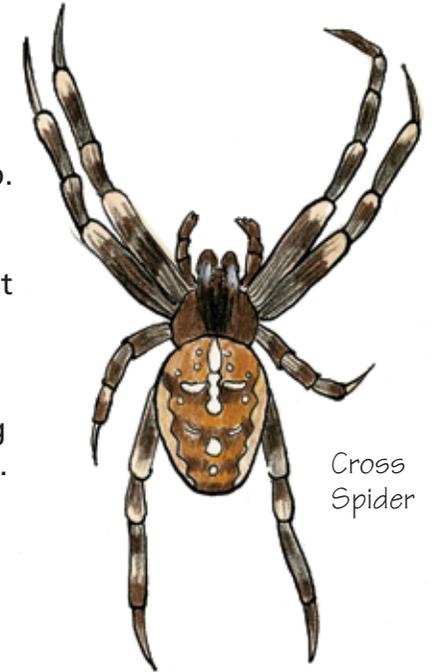


Don't be afraid to catch a spider and examine it in your magnifying glass. You'll see it has 8 legs. This is the reason spiders are not classed as an insect.

Using its web to catch insects is how the cross survives. It will cocoon a bug as soon as it gets caught in the net. The spinnerets located on the rear of the spider are how they spin their web. It will then inject a paralysing poison into the prey with its jaw that is on its head. It will over time suck the bug out of this cocoon.

Stitching a New Web

Even though the spider has 8 great big and tiny eyes, it does not see very well. The slightest movement on any string in its web lets it know that there is prey. It will eat its web at night and spin a new one in the morning.



Cross Spider

Wood Lice



You know that lobster; crabs, shrimp or crayfish are water animals. Do you know there is a form of these crustaceans that also inhabits you garden or cellar? They can be found in the compost heap, under stones and in dark corners of your cellar. These are the wood lice. They crawl on 10 legs instead of 14, but are still classed with the crustaceans, having left the water and making a preference for land.



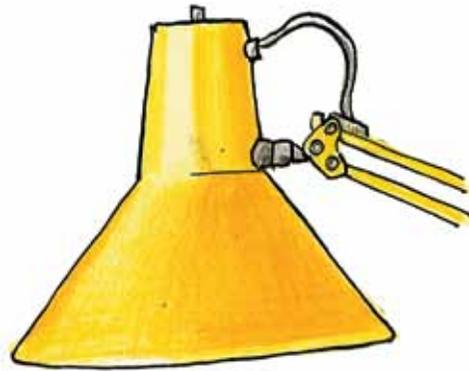
We can now do a few experiments that will not cause the lice any pain. Make sure to set them free again after you are done.



In your shallow tray, place roughly 10 to 15 wood lice you have caught. In one half of the tray, place a damp paper towel and a dry one in the other half. Watch and see where the lice like to hide. Where?



For this second experiment, you will need to place damp paper towel in both halves of the tray. Take a piece of cardboard and cover half of it. Now put the tray under a light, but not too hot of a light. Where will the wood lice go?



From these two experiments, you will have learned that the lice much prefer to live in dark and damp places. You now have the proof that these creatures descended from the water crustaceans. On the abdomen are gills that the lice breathe through much like a fish does. These gills need to be kept damp all the time.

Bright Light

Dark places are almost always damper than places in the sun. This is the reason the wood lice will shy away from bright areas. The evening is when these creatures will come out looking for food, as it is cooler and not so bright as it is during the day.



Scraps

Rotting leaves on the ground are a unique, tightly populated habitat



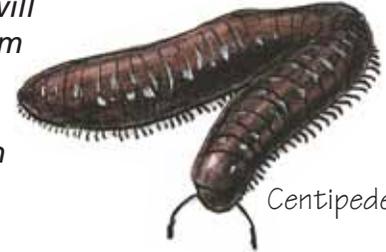
Take a plastic funnel and insert it into some type of container and fill with leaves and shine a light on it from above. The heat and light will eventually dry the leaves, causing the creatures to go down and eventually fall into your container.



You will see a whole assortment of insects in rotting leaves. Some eat parts of plants, others the bacteria and micro-organisms that are in the rotting leaves. And of course we can't forget the creatures that will hunt and chase these insects. Dashing across the leaves, you can see wolf spiders, centipedes and beetles.



Scarlet Mite



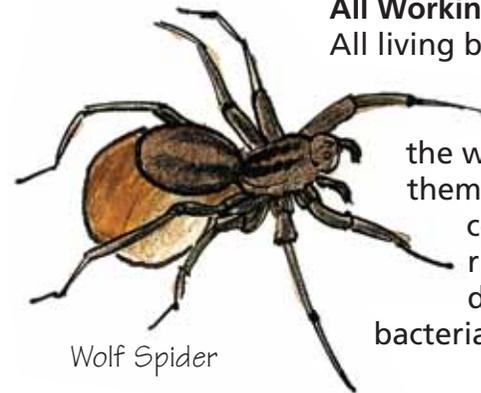
Centipede



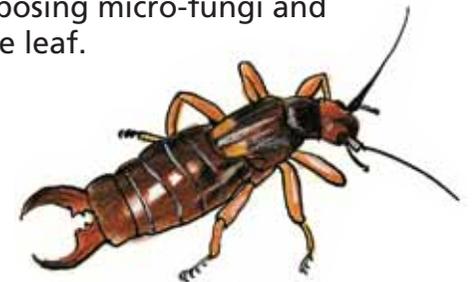
Springtail

All Working Together

All living beings have certain tasks that are required of them. From mites eating small holes in the leaves to the wood lice that eats bigger holes in them before earwigs and centipedes can come along and clean up the leaf rips. All of this provides the decomposing micro-fungi and bacteria of the leaf.



Wolf Spider



Earwig



Without the combined effort of all these creatures working together, the soil would go bad. That is the reason that dead trees, excrement, dead animals and leaves are decomposed fast. They replenish the soil.

A Tiny Queen and Her Followers

Most creatures you encounter are what we call lone wolves, even if they are in a group once in a while. Some insects are totally different.

Ants live a colony of hundreds to thousands. They all work and live for the benefit of the entire colony.

Work Groups

Ant society is governed very similar to our own. They are the caregivers that care for the eggs and offspring. Others are ones that go out into the world and gather food to bring back. Some have the lucky career of taking out the

garbage and dead ants or helping renovate the nest. Then there is the military. The soldier ants guard the queen and chase away intruders. Organising them all from her throne is the royal queen. She is the only one that is allowed to lay eggs and sustain the colony, so she is the most important ant there is. Other female ants serve and feed her.

Your kit has all the stuff to make your own ant colony so you can watch the ants' life for days.



Your Ant Colony



You need to fill the lower component of the ant farm with

fine sand. Be sure to add a few drops of water if you find the sand too dry, it needs to be slightly damp. Make sure the cover is on tightly, and place the container up somewhere and cover with a dark cloth. Place one end of the enclosed plastic tube onto one of the connectors on the side of the ant farm and the other end of the tube on the round container.

You will now need to go and look for some ants to populate your ant farm. You can find the black and brown garden ants under stones and flat rocks.



Once you have located a good nest, squirt in a few drops of sugared water or place a shredded raisin inside and put it near the nest. Shortly you will begin to see ants have detected the sweet treat you have laid for them and then lots more will appear. When you have enough in the container, replace the lid and take your ant farm home for observation.



You will need to leave them alone for now. Keep the ant farm container covered and only remove the cloth so you can observe the ants for a short time.





You may see that the ants have already started digging tunnels in the sand. Avoid any shocks, as this will destroy the tunnels they have carefully built.

The ants outside world now consists of the round container, so you will have to make sure you feed them honey water, half of a raisin, popcorn, fruit or a piece of meat regularly. Make sure the ants are not overfed. You must also keep their outside world, the round container, clean and sure nothing is rotting and always remember to replace the lid when finished.

What do you observe?



The ants will adjust to their new habitat in awhile.



Observe what happens when two ants meet, where they like to stay

and how they eat. Do you see where they have put the dead ants and garbage? If you let a large insect crawl around in the round container, what happens? Place a green stem with some wood lice on it and observe what happens.

Since you don't have a queen, you will not have any eggs or pupae and your colony will only survive for a few weeks at best. You will need to take your container back to where you got them from and release them and they will find their way back to their original nest. You will now need to take apart your ant farm and thoroughly clean it before you gather up another round of ants.

You will find that you will get hours of joy and knowledge from watching the ants in your ant farm. Be sure to enjoy your time and observations while you are in the Insects World!

